



C A L I F O R N I A E N E R G Y C O M M I S S I O N

2013 Energy Standards Nonresidential Indoor Lighting

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Goals for this Presentation

- **Simplify Energy Standards requirements for Nonresidential Lighting:**
 - Indoor lighting
 - Lighting controls
 - Acceptance testing



What does a Plans Examiner do?



- **Verify lighting wattage meet Certificate of Compliance**
 - i.e. LPDs (W/ft^2)
- **Verify mandatory measures are met**
 - Lighting Controls
- **Verify applicable Acceptance & Installation forms are specified**



Simplify Plan Review with Plans Review Checklist

- **Plan Review Checklist by EnergyCodeAce**
 - Specifies which components to verify on plans and NRCC forms
 - <http://energycodeace.com/content/resources-checklists/>

Ace Resources 2013 Nonresidential - Title 24, Part 6 **Energy Plans Review Checklist** *Nonresidential Prescriptive Method 3: Lighting*
New Construction, Addition, and/or Alteration
3 of 5 checklists to be completed
1: Overview & General Information, 2: Envelope, 3: Lighting
4: Mechanical, and 5: Process & Electrical

Permit Number: _____

NRCC-LTI-01 (Indoor)	Standards Section #	Project Notes (PE can use this section to record project data, as needed)	YES	NO*
Are the following NRCC inputs confirmed on the plans?				
Building type		Nonresidential / High-rise residential / Hotel-motel guestroom / Public school / Relocatable public school building	<input type="checkbox"/>	<input type="checkbox"/>
Report type		Conditioned / Unconditioned / Both	<input type="checkbox"/>	<input type="checkbox"/>
Construction type		New construction / Addition / Alteration	<input type="checkbox"/>	<input type="checkbox"/>
Method of compliance		Complete building / Area category / Tailored	<input type="checkbox"/>	<input type="checkbox"/>
Summary of allowed lighting power: Verify total installed watts			<input type="checkbox"/>	<input type="checkbox"/>
Verify adjusted installed lighting power			<input type="checkbox"/>	<input type="checkbox"/>
Verify allowed lighting power		See Section NRCC-LTI-03: Lighting Power Allowance below	<input type="checkbox"/>	<input type="checkbox"/>
Adjusted installed lighting allowed lighting power			<input type="checkbox"/>	<input type="checkbox"/>
Required Certificates of Installation and Acceptance match scope of work			<input type="checkbox"/>	<input type="checkbox"/>
Portable luminaires in offices: Verify installed lighting allowed lighting power			<input type="checkbox"/>	<input type="checkbox"/>
Verify light fixtures EXEMPT from lighting power calculations	§140.6(a)3		<input type="checkbox"/>	<input type="checkbox"/>
NRCC-LTI-02-E Lighting Controls				
Space type being reported		Conditioned / Unconditioned	<input type="checkbox"/>	<input type="checkbox"/>
Mandatory lighting controls scheduled match scope of project			<input type="checkbox"/>	<input type="checkbox"/>
Lighting schedule: Type of lighting controls	§130.1		<input type="checkbox"/>	<input type="checkbox"/>
Location of controls, number of luminaires per control, and standard section with which controls comply			<input type="checkbox"/>	<input type="checkbox"/>
Power adjustment factor (PAF) controls as allowed per table 140.6-A	§140.6(a)2		<input type="checkbox"/>	<input type="checkbox"/>
NRCC-LTI-03: Lighting Power Allowance				
Report type		Conditioned / Unconditioned	<input type="checkbox"/>	<input type="checkbox"/>
Allowed building watts matches values on compliance document NRCC-LTI-01		Yes / No	<input type="checkbox"/>	<input type="checkbox"/>
Complete Building Method				
Building type matches project and is listed in Table 140.6-B (90% of building occupancy)	Table 140.6-B		<input type="checkbox"/>	<input type="checkbox"/>
Wattage allowance per building type, building area			<input type="checkbox"/>	<input type="checkbox"/>

* Items marked "no" must be corrected



Were all applicable NRCC forms Submitted? NRCC-LTI

- **LTI-01:** Indoor Lighting
- **LTI-02:** Lighting Controls
- **LTI-03:** Power Allowance
- **LTI-04:** Tailored Method
- **LTI-05:** Line voltage track lighting

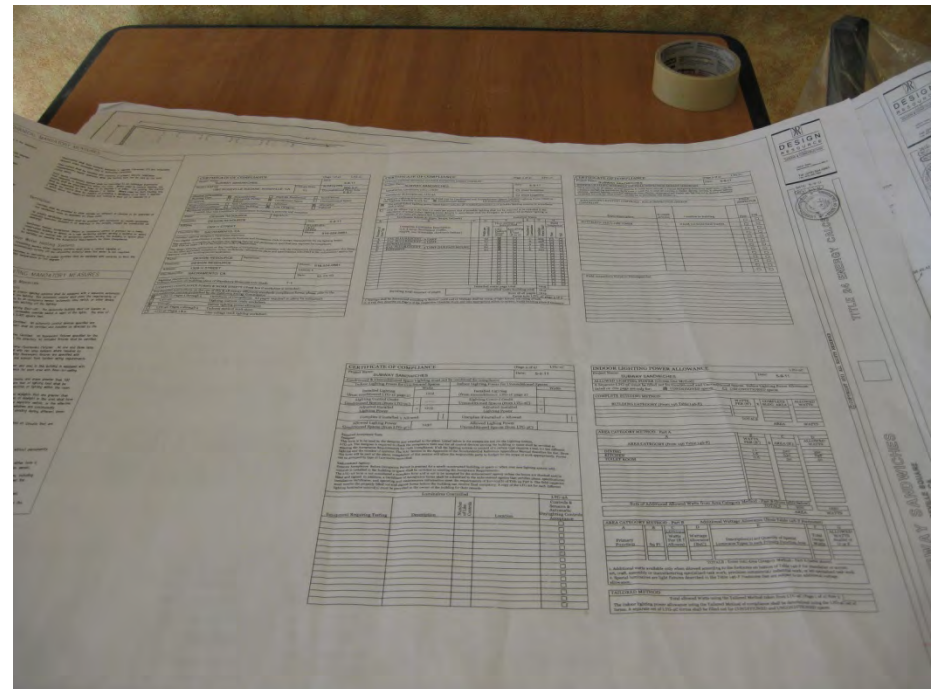


** Forms should be incorporated onto plans*



§10-103 and the Plans Examiner

- **Verify required Certificate of Compliance on plans**
 - NRCC-LTI-01, 02 and 03 are required for all submittals
 - NRCC-LTI-04 only required for Tailored Method
 - NRCC-LTI-05 only required when track lighting is specified





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§140.6 and the Plans Examiner

- Verify proposed watts/ft² on NRCC-LTI-01 form
 - Values should match lighting schedule on electrical plans
- Verify applicable Certificate of Acceptance and Installation forms specified on [NRCC-LTI-01](#)

STATE OF CALIFORNIA
INDOOR LIGHTING
(SEE INSTRUCTIONS) (REVISOR 01/14)
CERTIFICATE OF COMPLIANCE - USER INSTRUCTIONS
Indoor Lighting
Project Name: 2013 CALBO Training Sample Date Prepared: 9/19/14 (Page 4 of 5)

Total installed portable luminaire watts that are greater than 0.3 watts per square foot per office: Enter sum total of all pages into NRCC-LTI-01-E, Page 2

A separate Lighting Schedule must be filled out for conditioned and unconditioned spaces. Installed Lighting Power listed on this Lighting Schedule is only for:
☒ CONDITIONED SPACE ☐ UNCONDITIONED SPACE

C. INDOOR LIGHTING SCHEDULE and FIELD INSPECTION ENERGY CHECKLIST

A	B	C. Installed Watts				D	E	F	G	H. Field Inspector	
		Luminaire Schedule	Watts	Area	Watts per sq. ft.					Pass	Fail
1	Complete Luminaire Description (i.e. 3 lamp fluorescent troffer, 73278, one dimmable electronic ballast)	34.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20	680	Attic	<input type="checkbox"/>	<input type="checkbox"/>		
2	4 ft Fluorescent T8 Rapid Start Elec	40.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20	800	Sales Floor	<input type="checkbox"/>	<input type="checkbox"/>		
3		62.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20	1,240	Office Space	<input type="checkbox"/>	<input type="checkbox"/>		
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INSTALLED WATTS PAGE TOTAL: Enter sum total of all pages into NRCC-LTI-01-E, Page 2

CA Building Energy Efficiency Standards - 2013 Residential Compliance June 2013



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Let's Discuss Mandatory Indoor Lighting Requirements



Mandatory Indoor Lighting Requirements

- **Mandatory req. include:**
 - Requirements for lighting control devices & systems (§110.9)
 - Lighting Controls
 - Acceptance Testing



Mandatory Indoor Lighting Controls

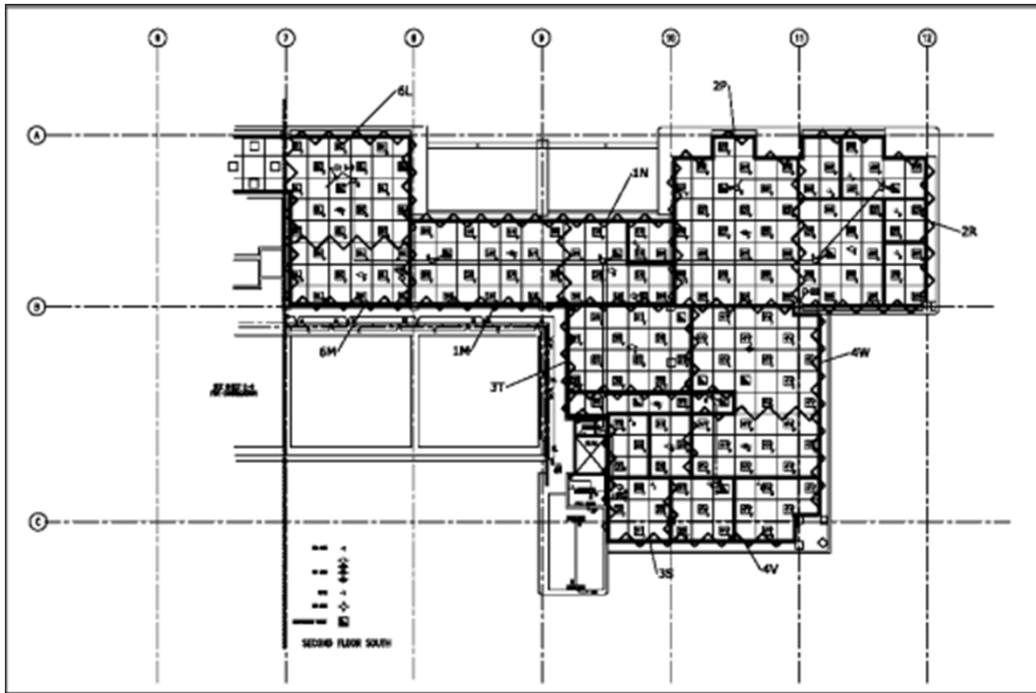
Section	Control Type
§130.1(a)	Area Controls
§130.1(b)	Multi-Level Lighting Controls
§130.1(c)	Shut-OFF Controls
§130.1(d)	Automatic Daylighting Controls
§130.1(e)	Demand Responsive Controls



Area Controls

§130.1(a)

- **Does each space have manual ON/OFF control?**
 - Each space separately controlled
 - Readily accessible
- **Verify on electrical plans**





Area Controls

§130.1(a)

- **General Lighting controlled separately from other lighting types:**
 - Display
 - Ornamental
 - Special effects
 - Display case



Multi-Level Lighting Control

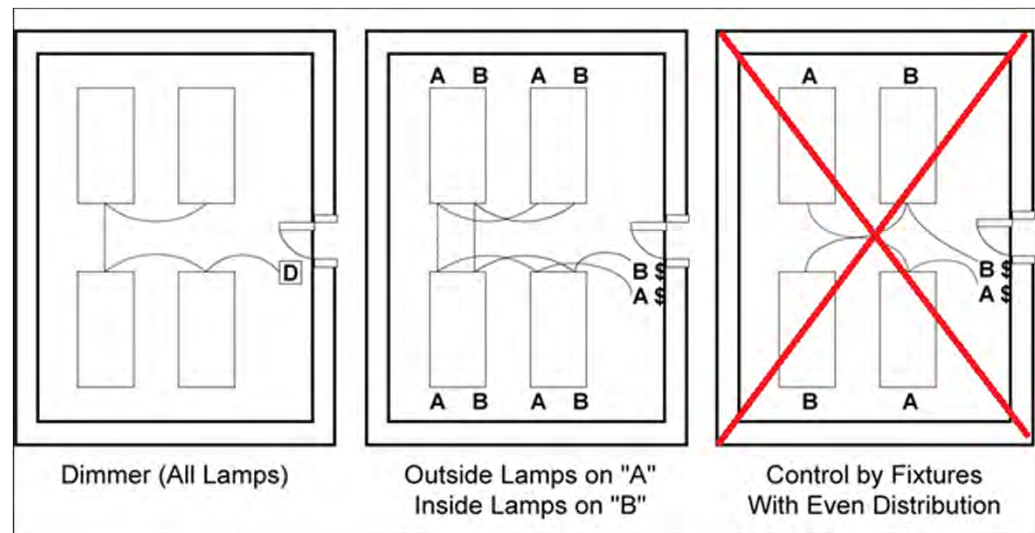
§130.1(b)

- **Do required spaces have multi-level controls?**

- General lighting only
- $\geq 100 \text{ ft}^2$; and
- $> 0.5 \text{ W/ft}^2$

- **Verify on electrical plans:**

- Multi-level control meets
TABLE 130.1-A





Multi-Level Lighting Control

§130.1(b)

- **TABLE 130.1-A**
- **Most luminaire types require:**
 - Continuous dimming; or
 - Step dimming; or
 - Switching alternate lamps
- **A/B or “checker board” switching not allowed**

TABLE 130.1-A MULTI-LEVEL LIGHTING CONTROLS AND UNIFORMITY REQUIREMENTS

Luminaire Type	Minimum Required Control Steps (percent of full rated power ¹)				Uniform level of illuminance shall be achieved by:
Line-voltage sockets except GU-24	Continuous dimming 10-100 percent				
Low-voltage incandescent systems					
LED luminaires and LED source systems					
GU-24 rated for LED	Continuous dimming 20-100 percent				
GU-24 sockets rated for fluorescent > 20 watts					
Pin-based compact fluorescent > 20 watts ²					
GU-24 sockets rated for fluorescent ≤ 20 watts	Minimum one step between 30-70 percent				Stepped dimming; or Continuous dimming; or Switching alternate lamps in a luminaire
Pin-based compact fluorescent ≤ 20 watts ²					
Linear fluorescent and U-bent fluorescent ≤ 13 watts					
Linear fluorescent and U-bent fluorescent > 13 watts	Minimum one step in each range:				Stepped dimming; or Continuous dimming; or switching alternate lamps in each luminaire, having a minimum of 4 lamps per luminaire, illuminating the same area and in the same manner
	20-40 %	50-70 %	80-85 %	100 %	
Track Lighting	Minimum one step between 30 - 70 percent				Step dimming; or Continuous dimming; or Separately switching circuits in multi-circuit track with a minimum of two circuits.
HID > 20 watts	Minimum one step between 50 - 70 percent				Stepped dimming; or Continuous dimming; or Switching alternate lamps in each luminaire, having a minimum of 2 lamps per luminaire, illuminating the same area and in the same manner.
Induction > 25 watts					
Other light sources					

1. Full rated input power of ballast and lamp, corresponding to maximum ballast factor
2. Includes only pin based lamps: twin tube, multiple twin tube, and spiral lamps

TABLE 130.1-A MULTI-LEVEL LIGHTING CONTROLS AND UNIFORMITY REQUIREMENTS

Luminaire Type	Minimum Required Control Steps (percent of full rated power¹)				Uniform level of illuminance shall be achieved by:
Line-voltage sockets except GU-24	Continuous dimming 10-100 percent				
Low-voltage incandescent systems					
LED luminaires and LED source systems					
GU-24 rated for LED					
GU-24 sockets rated for fluorescent > 20 watts	Continuous dimming 20-100 percent				
Pin-based compact fluorescent > 20 watts ²					
GU-24 sockets rated for fluorescent ≤ 20 watts	Minimum one step between 30-70 percent				Stepped dimming; or
Pin-based compact fluorescent ≤ 20 watts ²					Continuous dimming; or
Linear fluorescent and U-bent fluorescent ≤ 13 watts					Switching alternate lamps in a luminaire
Linear fluorescent and U-bent fluorescent > 13 watts	Minimum one step in each range:				Stepped dimming; or Continuous dimming; or switching alternate lamps in each luminaire, having a minimum of 4 lamps per luminaire, illuminating the same area and in the same manner
	20-40 %	50-70 %	80-85 %	100 %	
Track Lighting	Minimum one step between 30 – 70 percent				Step dimming; or Continuous dimming; or Separately switching circuits in multi-circuit track with a minimum of two circuits.
HID > 20 watts	Minimum one step between 50 - 70 percent				Stepped dimming; or
Induction > 25 watts					Continuous dimming; or
Other light sources					Switching alternate lamps in each luminaire, having a minimum of 2 lamps per luminaire, illuminating the same area and in the same manner.

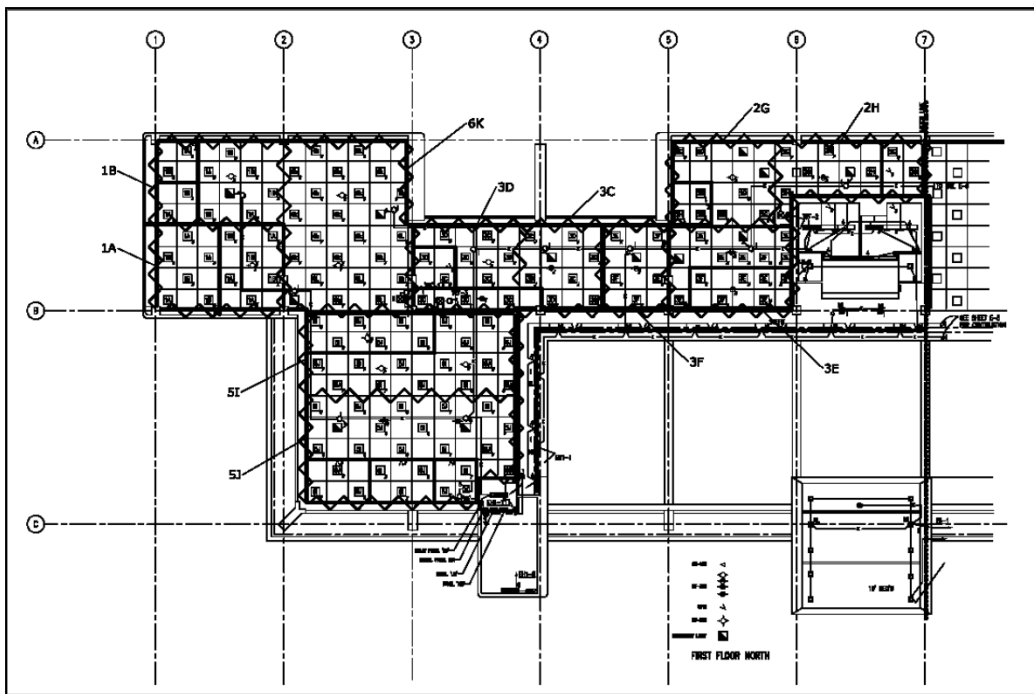
1. Full rated input power of ballast and lamp, corresponding to maximum ballast factor

2. Includes only pin based lamps: twin tube, multiple twin tube, and spiral lamps



Shut-OFF Controls

§130.1(c)



Are shut-off controls specified?

- Occupant Sensing; or
- Automatic time switch
 - Must have override control

Verify on electrical plans



Shut-OFF Controls

§130.1(c)

- **Some areas require occupancy sensors**
- **Areas where occupant sensing control are required to shut-off all lighting:**
 - Offices 250 ft² or smaller
 - Multipurpose rooms less than 1,000 ft²
 - Classrooms
 - Conference rooms



Shut-OFF Controls

§130.1(c)

- **Areas where partial ON/OFF occupant sensing controls are required in addition to shut-off control:**
 - Aisle ways and open areas in warehouses
 - Library book stack aisles
 - Corridors and stairwells
- **Reduce lighting by at least 50% when space is unoccupied**
- **Shut-off ALL lighting when space typically unoccupied**



Shut-OFF Controls

§130.1(c)

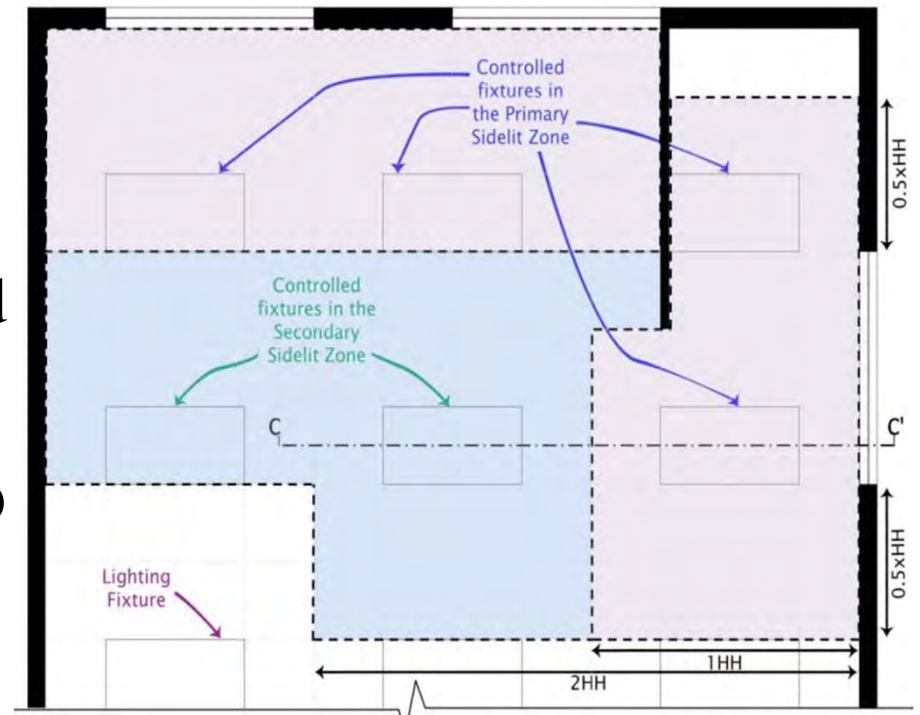
- **Areas where partial ON/OFF occupant sensing controls required instead of shut-off control:**
 - Stairwells and common area corridors
 - In hotels/motels, high rise res
 - Parking garages
 - Parking areas
 - Loading/unloading areas
- **Lighting not required to be fully shut-off in these areas**



Automatic Daylighting Controls

§130.1(d)

- **Are daylight controls specified? Req. if:**
 - ≥ 120 watts of lighting within the daylit zone; and
 - ≥ 24 ft² glazing area
- **Daylit zones required to be shown on plans**





Automatic Daylighting Controls

§130.1(d)

- **Automatic Daylight Controls:**
 - Apply to general lighting only
 - Lighting in daylit zones must be separately controlled
 - Skylit Daylit Zone
 - Primary Sidelit Daylit Zone
 - Meet uniformity req. of TABLE 130.1-A



Automatic Daylighting Controls

§130.1(d)

- **Are daylight controls specified in the Parking Garage?**
 - ≥ 60 watts of lighting in primary sidelit zone; and
 - $\geq 36 \text{ ft}^2$ of glazing or opening
 - Automatic daylighting control can be multilevel, continuous dimming or ON/OFF



Demand Responsive Controls

§130.1(e)

- **Are DR controls specified? Req. if:**
 - Building is greater than 10,000 ft²
- **DR control should be capable of reducing total lighting power by minimum 15%**
 - Spaces with LPD < 0.5 W/ft² do not count toward total lighting power
 - Non-habitable spaces cannot be used to satisfy this requirement
 - Closets, storage areas, etc.



Demand Responsive Controls

§130.1(e)

- **Areas with LPD less than 0.5 W/ft² not counted toward 10,000 ft² trigger**
 - Clarified in May-June Blueprint Newsletter
- **Example:**
 - 15,000 ft² parking garage
 - Parking Area LPD 0.14 W/ft²
 - 500 ft² elevator lobby with LPD of 0.6 W/ft²
 - Should Demand Response control be required in this space?



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Questions on Mandatory Req.?





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Let's Discuss Prescriptive Indoor Lighting Requirements



Prescriptive Indoor Lighting Requirements

- **Prescriptive req. include:**
 - Calculation of indoor lighting power
 - Power adjustment factors
 - Automatic daylight control in secondary daylight zones



Calculation of Allowed Lighting Power

§140.6(c)

- **Three methods for compliance:**
 - Complete building method (TABLE 140.6-B)
 - Area category method (TABLE 140.6-C)
 - Tailored method (TABLE 140.6-D through G)



Calculation of Allowed Lighting Power

§140.6(c)

- **Complete Building Method**
 - TABLE 140.6-B lists building types and corresponding LPD
 - Single LPD for entire building

TABLE 140.6-B COMPLETE BUILDING METHOD LIGHTING POWER DENSITY VALUES

TYPE OF BUILDING	ALLOWED LIGHTING POWER DENSITY (WATTS PER SQUARE FOOT)
Auditorium Building	1.5
Classroom Building	1.1
Commercial and Industrial Storage Building	0.6
Convention Center Building	1.2
Financial Institution Building	1.1
General Commercial Building/Industrial Work Building	1.0
Grocery Store Building	1.5
Library Building	1.3
Medical Building/Clinic Building	1.1
Office Building	0.8
Parking Garage Building	0.2
Religious Facility Building	1.6
Restaurant Building	1.2
School Building	1.0
Theater Building	1.3
All others buildings	0.6

TABLE 140.6-B COMPLETE BUILDING METHOD LIGHTING POWER DENSITY VALUES

TYPE OF BUILDING	ALLOWED LIGHTING POWER DENSITY (WATTS PER SQUARE FOOT)
Auditorium Building	1.5
Classroom Building	1.1
Commercial and Industrial Storage Building	0.6
Convention Center Building	1.2
Financial Institution Building	1.1
General Commercial Building/Industrial Work Building	1.0
Grocery Store Building	1.5
Library Building	1.3
Medical Building/Clinic Building	1.1
Office Building	0.8
Parking Garage Building	0.2
Religious Facility Building	1.6
Restaurant Building	1.2
School Building	1.0
Theater Building	1.3
All others buildings	0.6



Calculation of Allowed Lighting Power

§140.6(c)

- Area Category Method**

- TABLE 140.6-C lists function areas and corresponding LPD
- Each area calculated separately
- Sum allowed lighting power for all areas

TABLE 140.6-C AREA CATEGORY METHOD - LIGHTING POWER DENSITY VALUES (WATTS/FT²)

PRIMARY FUNCTION AREA		ALLOWED LIGHTING POWER (W/ft ²)	PRIMARY FUNCTION AREA		ALLOWED LIGHTING POWER (W/ft ²)
Auditorium Area		1.5 ³	Library Area	Reading areas	1.2 ³
Auto Repair Area		0.9 ²		Stack areas	1.5 ³
Beauty Salon Area		1.7	Lobby Area	Hotel lobby	1.1 ³
Civic Meeting Place Area		1.3 ³		Main entry lobby	1.5 ³
Classroom, Lecture, Training, Vocational Areas		1.2 ⁵	Locker/Dressing Room		0.8
Commercial and Industrial Storage Areas (conditioned and unconditioned)		0.6	Lounge Area		1.1 ³
Commercial and Industrial Storage Areas (refrigerated)		0.7	Malls and Atria		1.2 ³
Convention, Conference, Multipurpose and Meeting Center Areas		1.4 ³	Medical and Clinical Care Area		1.2
Corridor, Restroom, Stair, and Support Areas		0.6	Office Area	> 250 square feet	0.75
Dining Area		1.1 ³		≤ 250 square feet	1.0
Electrical, Mechanical, Telephone Rooms		0.7 ²	Parking Garage Area	Parking Area	0.14
Exercise Center, Gymnasium Areas		1.0		Dedicated Ramps	0.3
Exhibit, Museum Areas		2.0		Daylight Adaptation Zones ⁹	0.6
Financial Transaction Area		1.2 ³	Religious Worship Area		1.5 ³
General Commercial and Industrial Work Areas	Low bay	0.9 ²	Retail Merchandise Sales, Wholesale Showroom Areas		1.2 ^{6 and 7}
	High bay	1.0 ²			
	Precision	1.2 ⁴	Theater Area	Motion picture	0.9 ³
Grocery Sales Area		1.2 ^{6 and 7}		Performance	1.4 ³

TABLE 140.6-C AREA CATEGORY METHOD - LIGHTING POWER DENSITY VALUES (WATTS/FT²)

PRIMARY FUNCTION AREA		ALLOWED LIGHTING POWER (W/ft ²)	PRIMARY FUNCTION AREA		ALLOWED LIGHTING POWER (W/ft ²)
Auditorium Area		1.5 ³	Library Area	Reading areas	1.2 ³
Auto Repair Area		0.9 ²		Stack areas	1.5 ³
Beauty Salon Area		1.7	Lobby Area	Hotel lobby	1.1 ³
Civic Meeting Place Area		1.3 ³		Main entry lobby	1.5 ³
Classroom, Lecture, Training, Vocational Areas		1.2 ⁵	Locker/Dressing Room		0.8
Commercial and Industrial Storage Areas (conditioned and unconditioned)		0.6	Lounge Area		1.1 ³
Commercial and Industrial Storage Areas (refrigerated)		0.7	Malls and Atria		1.2 ³
Convention, Conference, Multipurpose and Meeting Center Areas		1.4 ³	Medical and Clinical Care Area		1.2
Corridor, Restroom, Stair, and Support Areas		0.6	Office Area	> 250 square feet	0.75
Dining Area		1.1 ³		≤ 250 square feet	1.0
Electrical, Mechanical, Telephone Rooms		0.7 ²	Parking Garage Area	Parking Area	0.14
Exercise Center, Gymnasium Areas		1.0		Dedicated Ramps	0.3
Exhibit, Museum Areas		2.0		Daylight Adaptation Zones ⁹	0.6
Financial Transaction Area		1.2 ³	Religious Worship Area		1.5 ³
General Commercial and Industrial Work Areas	Low bay	0.9 ²	Retail Merchandise Sales, Wholesale Showroom Areas		1.2 ^{6 and 7}
	High bay	1.0 ²			
	Precision	1.2 ⁴	Theater Area	Motion picture	0.9 ³
Grocery Sales Area		1.2 ^{6 and 7}		Performance	1.4 ³
Hotel Function Area		1.5 ³	Transportation Function Area		1.2
Kitchen, Food Preparation Areas		1.6	Videoconferencing Studio		1.2 ⁸
Laboratory Area, Scientific		1.4 ¹	Waiting Area		1.1 ³
Laundry Area		0.9	All other areas		0.6

Footnotes for this table are listed below.

FOOTNOTES FOR TABLE 140.6-C:

See Section 140.6(c)2 for an explanation of additional lighting power available for specialized task work, ornamental, precision, accent, display, decorative, and white boards and chalk boards, in accordance with the footnotes in this table. The smallest of the added lighting power listed in each footnote below, or the actual design wattage, may be added to the allowed lighting power only when using the Area Category Method of compliance.

Footnote number	Type of lighting system allowed	Maximum allowed added lighting power. (W/ft ² of task area unless otherwise noted)
1	Specialized task work	0.2 W/ft ²
2	Specialized task work	0.5 W/ft ²
3	Ornamental lighting as defined in Section 100.1 and in accordance with Section 140.6.(c)2.	0.5 W/ft ²
4	Precision commercial and industrial work	1.0 W/ft ²
5	Per linear foot of white board or chalk board.	5.5 W per linear foot
6	Accent, display and feature lighting - luminaires shall be adjustable or directional	0.3 W/ft ²
7	Decorative lighting - primary function shall be decorative and shall be in addition to general illumination.	0.2 W/ft ²
8	Additional Videoconferencing Studio lighting complying with all of the requirements in Section 140.6(c)2Gvii.	1.5 W/ft ²
9	Daylight Adaptation Zones shall be no longer than 66 feet from the entrance to the parking garage	



Calculation of Allowed Lighting Power

§140.6(c)

- **Tailored Method:**
 - [TABLE 140.6-D](#) lists function areas and target illumination levels
 - Calculates general lighting power allowance
 - Provides additional allowance for specialized lighting
 - Wall display
 - Floor display
 - Ornamental

TABLE 140.6-D TAILORED METHOD LIGHTING POWER ALLOWANCES

1	2	3	4	5
Primary Function Area	General Illumination Level (Lux)	Wall Display Power (W/ft)	Allowed Combined Floor Display Power and Task Lighting Power (W/ft²)	Allowed Ornamental/ Special Effect Lighting
Auditorium Area	300	2.25	0.3	0.5
Civic Meeting Place	300	3.15	0.2	0.5
Convention, Conference, Multipurpose, and Meeting Center Areas	300	2.50	0.4	0.5
Dining Areas	200	1.50	0.6	0.5
Exhibit, Museum Areas	150	15.0	1.2	0.5
Financial Transaction Area	300	3.15	0.2	0.5
Grocery Store Area	500	8.00	0.9	0.5
Hotel Function Area	400	2.25	0.2	0.5
Lobby Area:				
Hotel lobby	200	3.15	0.2	0.5
Main entry lobby	200	0	0.2	0
Lounge Area	200	7.00	0	0.5
Malls and Atria	300	3.50	0.5	0.5
Religious Worship Area	300	1.50	0.5	0.5
Retail Merchandise Sales, and Showroom Areas	400	14.00	1.0	0.5
Theater Area:				
Motion picture	200	3.00	0	0.5
Performance	200	6.00	0	0.5
Transportation Function Area	300	3.15	0.3	0.5
Waiting Area	300	3.15	0.2	0.5



Calculation of Allowed Lighting Power

§140.6(c)

- **Tailored Method Calculation:**

- LPD of the space dependent on Room Cavity Ratio and target illumination level
- [Table 140.6-F](#), Room Cavity Ratio equations

$$RCR = \frac{5 \times H \times (L + W)}{L \times W} \quad RCR = \frac{2.5 \times H \times P}{A}$$

- [Table 140.6-G](#), Tailored Method LPDs



Calculation of Allowed Lighting Power

§140.6(c)

- **Tailored & Area Category Method can be used together in a building. Each space must use one or the other.**
 - Tailored method task lighting cannot be traded off, only general lighting
- **If Complete Building Method is used, Tailored & Area Category cannot be used.**



Power Adjustment Factors (PAF)

§140.6(a)2

- **Allows for reduction of lighting power**
 - Installing controls beyond mandatory req.

TABLE 140.6-A LIGHTING POWER DENSITY ADJUSTMENT FACTORS (PAF)

TYPE OF CONTROL		TYPE OF AREA	FACTOR
a. To qualify for any of the Power Adjustment Factors in this table, the installation shall comply with the applicable requirements in Section 140.6(a)2			
b. Only one PAF may be used for each qualifying luminaire unless combined below.			
c. Lighting controls that are required for compliance with Part 6 shall not be eligible for a PAF			
1. Partial-ON Occupant Sensing Control		Any area \leq 250 square feet enclosed by floor-to-ceiling partitions; any size classroom, conference or waiting room.	0.20
2. Occupant Sensing Controls in Large Open Plan Offices		In open plan offices > 250 square feet: One sensor controlling an area that is:	No larger than 125 square feet
			From 126 to 250 square feet
			From 251 to 500 square feet
3. Dimming System	Manual Dimming	Hotels/motels, restaurants, auditoriums, theaters	0.10
	Multiscene Programmable		0.20
4. Demand Responsive Control		All building types less than 10,000 square feet. Luminaires that qualify for other PAFs in this table may also qualify for this demand responsive control PAF	0.05
5. Combined Manual Dimming plus Partial-ON Occupant Sensing Control		Any area \leq 250 square feet enclosed by floor-to-ceiling partitions; any size classroom, conference or waiting room	0.25

TABLE 140.6-A LIGHTING POWER DENSITY ADJUSTMENT FACTORS (PAF)

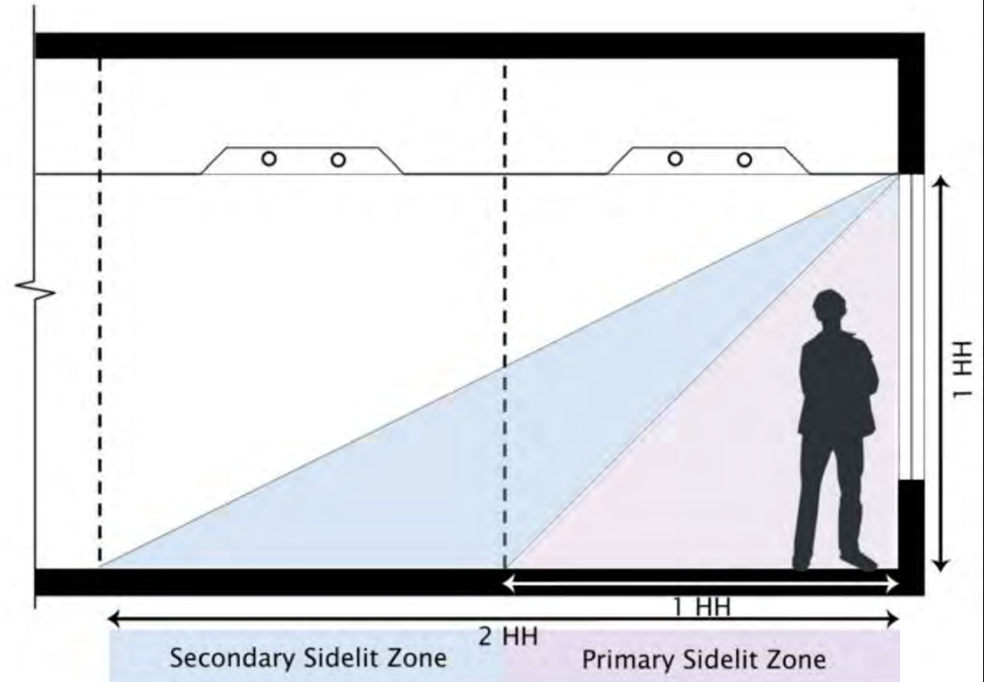
TYPE OF CONTROL		TYPE OF AREA	FACTOR
a. To qualify for any of the Power Adjustment Factors in this table, the installation shall comply with the applicable requirements in Section 140.6(a)2 b. Only one PAF may be used for each qualifying luminaire unless combined below. c. Lighting controls that are required for compliance with Part 6 shall not be eligible for a PAF			
1. Partial-ON Occupant Sensing Control		Any area \leq 250 square feet enclosed by floor-to-ceiling partitions; any size classroom, conference or waiting room.	0.20
2. Occupant Sensing Controls in Large Open Plan Offices		In open plan offices > 250 square feet: One sensor controlling an area that is:	No larger than 125 square feet
			From 126 to 250 square feet
			From 251 to 500 square feet
3. Dimming System	Manual Dimming	Hotels/motels, restaurants, auditoriums, theaters	0.10
	Multiscene Programmable		0.20
4. Demand Responsive Control		All building types less than 10,000 square feet. Luminaires that qualify for other PAFs in this table may also qualify for this demand responsive control PAF	0.05
5. Combined Manual Dimming plus Partial-ON Occupant Sensing Control		Any area \leq 250 square feet enclosed by floor-to-ceiling partitions; any size classroom, conference or waiting room	0.25



Daylight Controls in Secondary Zones

§140.6(d)

- **Secondary Daylit Zones**
 - Meet req. of §130.1(d)2
 - Separately controlled
 - Shown on the plans
- **Daylight control in Secondary Daylit Zones can be traded off**





CALIFORNIA ENERGY COMMISSION

Questions on Prescriptive Req.?





CALIFORNIA ENERGY COMMISSION

Let's Discuss Lighting Controls Acceptance Testing



Acceptance Testing

§130.4

- **Acceptance Testing introduced in 2005**
- **2013 Standards require certified Acceptance Test Technicians (ATTs)**
- **ATTs certified through CEC approved ATTCPs**



Acceptance Testing

§130.4

- **Two providers certified (as of 6/30/2015)**
 - National Lighting Contractors Association of America (NLCAA)
 - California Advanced Lighting Controls Training Program (CALCTP)
- **More information:**
 - <http://www.energy.ca.gov/title24/attcp/>



Acceptance Testing

§130.4

- **Acceptance testing always required when lighting controls are installed**
 - New Construction
 - Additions
 - Alterations
- **Acceptance testing required if building is under 10,000 ft²?**
 - YES



Acceptance Testing

§130.4

- **Verify that applicable Certificate of Acceptance (NRCA) forms are specified/completed.**
- **Verify that ATT is certified by an approved provider:**
 - NLCAA
 - CALCTP
- **List of certified ATTs can be found on each providers respective websites**



Acceptance Testing

§130.4

- **CALCTP and NLCAA have each developed Certificate of Acceptance documentation.**
- **These “alternative” forms have been approved by the Executive Director of the Energy Commission**
 - Will have CALCTP or NLCAA logo on the form
 - Will look similar to CEC form with the same content and informational order



Acceptance Testing

§130.4

- **Certificate of Acceptance Forms:**
 - NRCA-LTI-02 (Lighting Controls Acceptance)
 - NRCA-LTI-03 (Automatic Daylight Controls)
 - NRCA-LTI-04 (Demand Responsive Controls)
 - NRCA-LTO-02 (Outdoor Lighting Controls)



In Summary

- Acceptance testing is required for indoor/outdoor lighting controls
- When applicable, acceptance tests must be specified on the NRCC-LTI-01 form at permit
- Field technician must report results of acceptance testing on respective NRCA form at final inspection
- Field technicians performing testing for indoor/outdoor lighting must be a certified Acceptance Test Technician



CALIFORNIA ENERGY COMMISSION

Questions on Acceptance Testing?





CALIFORNIA ENERGY COMMISSION

Let's Discuss Lighting Alterations



Additions and Alterations

- **Additions**
 - same requirements as a newly constructed building
- **Lighting alterations**
 - certain control requirements based on project scope
- **Acceptance Testing required**



Lighting Alterations

- **Three types of lighting alterations:**
 - Lighting system alterations (§141.0(b)2Iii)
 - Luminaire modification-in-place (§141.0(b)2Iiii)
 - Lighting wiring alterations (§141.0(b)2Iiv)
- **Let's discuss each type**



Lighting System Alterations

§141.0(b)2Iii

- **Lighting System Alterations:**
 - Existing lighting system modified; or
 - Luminaires replaced; or
 - Luminaires disconnected from the circuit, removed and reinstalled, whether in the same location or installed elsewhere (i.e. relocated)
- **Only triggered if new luminaires are added or existing luminaires are altered.**



Lighting System Alterations

§141.0(b)2Iii

- **Lighting system alterations meet req. in TABLE 141.0-E**
- **Four Scenarios:**
 - $< 10\%$ luminaires affected
 - $\geq 10\%$ luminaires affected, and $LPD \leq 85\%$ of allowed
 - $\geq 10\%$ luminaires affected, and $LPD > 85\%$ of allowed
 - Change in area, space type, increase in LPD

LPD stands for Lighting Power Density (Watts/ft²)



Lighting System Alterations

§141.0(b)2Iii

- **< 10% of luminaires affected in enclosed space**
 - No Requirement
 - Allows for repairs without triggering code.
- **Let's look at TABLE 141.0-E**



Lighting System Alterations

§141.0(b)2Iii

TABLE 141.0-E Requirements for Luminaire Alterations

Quantity of existing affected luminaires per Enclosed Space ¹	Resulting Lighting Power for Each Enclosed Space	Applicable Mandatory Control Provisions for Each Enclosed Space	Multi-level Lighting Control Requirements for Each Altered Luminaire
Alterations that do not change the area of the enclosed space or the space type			
Sum total < 10% of existing luminaires	Existing lighting power is permitted	Existing provisions are permitted	Existing controls are permitted
Sum total ≥ 10% of existing luminaires	≤ 85% of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c)	Two level lighting control ² or §130.1(b)
	> 85% of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c), (d) ³	§130.1(b)
Alterations that change the area of the enclosed space or the space type or increase the lighting power in the enclosed space			
Any number	Comply with Section 140.6	§130.0(d) ³ §130.1(a), (c), (d) ³ , (e)	§130.1(b)
<p>1. Affected luminaires include any luminaire that is changed, replaced, removed, relocated; or, connected to, altered or revised wiring, except as permitted by EXCEPTIONS 1 and 2 to Section 141.0(b)2Iii:</p> <p>2. Two level lighting control shall have at least one control step between 30 percent and 70 percent of design lighting power in a manner providing reasonably uniform illuminations</p> <p>3. Daylight controls in accordance with Section 130.0(d) are required only for luminaires that are altered.</p>			



Lighting System Alterations

§141.0(b)2Iii

- **$\geq 10\%$ of luminaires affected in the enclosed space. Req. controls (depending on LPD):**
 - Area controls
 - Shutoff controls
 - Multi-level control*
 - Daylight Control*

*Multi-level and Daylight control apply to altered luminaires only



Lighting System Alterations

§141.0(b)2Iii

TABLE 141.0-E Requirements for Luminaire Alterations

Quantity of existing affected luminaires per Enclosed Space ¹	Resulting Lighting Power for Each Enclosed Space	Applicable Mandatory Control Provisions for Each Enclosed Space	Multi-level Lighting Control Requirements for Each Altered Luminaire
Alterations that do not change the area of the enclosed space or the space type			
Sum total < 10% of existing luminaires	Existing lighting power is permitted	Existing provisions are permitted	Existing controls are permitted
Sum total ≥ 10% of existing luminaires	≤ 85% of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c)	Two level lighting control ² or §130.1(b)
	> 85% of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c), (d) ³	§130.1(b)
Alterations that change the area of the enclosed space or the space type or increase the lighting power in the enclosed space			
Any number	Comply with Section 140.6	§130.0(d) ³ §130.1(a), (c), (d) ³ , (e)	§130.1(b)
<p>1. Affected luminaires include any luminaire that is changed, replaced, removed, relocated; or, connected to, altered or revised wiring, except as permitted by EXCEPTIONS 1 and 2 to Section 141.0(b)2Iii:</p> <p>2. Two level lighting control shall have at least one control step between 30 percent and 70 percent of design lighting power in a manner providing reasonably uniform illuminations</p> <p>3. Daylight controls in accordance with Section 130.0(d) are required only for luminaires that are altered.</p>			



Lighting System Alterations

§141.0(b)2Iii

- **Alterations that change area of enclosed space, change space type, or increase lighting power, and that alter luminaires**

- Area controls
- Shutoff controls
- Multi-level control*
- Daylight Control*
- **Demand Response Control**

DR control required only if altered area is greater than 10,000 ft²

*Multi-level and Daylight control applies to the altered luminaires only



Luminaire Modification-in-Place

§141.0(b)2Iiii

- **Luminaire Modifications-in-Place (LMIP):**
 - Replacing both lamps and ballasts
 - Modifying internals of the luminaire
 - Changing optical system
 - One for one replacement of luminaires
- **LMIP shall not be part of general remodeling or renovation, or changes to wiring to the lighting system.**



Luminaire Modification-in-Place

§141.0(b)2Iiii

- **LMIP triggered in the enclosed space only if:**
 - ≥ 40 luminaires in a building space are MIP; and
 - $\geq 10\%$ of the luminaires in the enclosed space

TABLE 5- 13 Thresholds for Luminaire-Modifications-in-Place requirements

Number of Luminaire-Modifications-in-Place		Is compliance required for that enclosed space?
Per annum per building space	In an enclosed space	
< 40 in number	< 10%	No
< 40 in number	$\geq 10\%$	No
≥ 40 in number	< 10%	No
≥ 40 in number	$\geq 10\%$	Yes



Luminaire Modification-in-Place

§141.0(b)2Iiii

- **LMIP meet req. of TABLE 141.0-F**
- **Req. controls (depending on LPD):**
 - Area controls
 - Shutoff controls
 - Multi-level control*
 - Daylight Control*
- **Let's look at TABLE 141.0-F**

*Multi-level and Daylight control applies to the altered luminaires only



Luminaire Modification-in-Place

§141.0(b)2Iiii

TABLE 141.0-F-Requirements for Luminaire Modifications-in-Place

For compliance with this Table, building space is defined as any of the following:			
<ol style="list-style-type: none"> 1. A complete single story building 2. A complete floor of a multifloor building 3. The entire space in a building of a single tenant under a single lease 4. All of the common, not leasable space in single building 			
Quantity of affected luminaires per Building Space per annum	Resulting Lighting Power per Each Enclosed Space Where $\geq 10\%$ of Existing Luminaires are Luminaire Modifications-in-Place	Applicable mandatory control provisions for each enclosed space ¹	Applicable multi-level lighting control requirements for each modified luminaire ²
Sum total < 40 Luminaire Modifications-in-Place	Existing lighting power is permitted	Existing provisions are permitted	Existing controls are permitted
Sum total ≥ 40 Luminaire Modifications-in-Place	$\leq 85\%$ of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c)	Two level lighting control ³ Or §130.1(b)
	$> 85\%$ of allowed lighting power per Section 140.6 Area Category Method	§130.0(d) ⁴ §130.1(a), (c), (d) ⁴	§130.1(b)



Lighting Wiring Alteration

§141.0(b)2Iiv

- **Lighting Wiring Alterations:**
 - Adding a circuit feeding luminaires
 - Modifying/relocating wiring to luminaires
 - Replacing wiring between switch or panelboard and luminaires
 - Replacing or installing new panelboard feeding lighting systems
- **Must meet *applicable* requirements of §110.9, §130.1, and §130.4**



CALIFORNIA ENERGY COMMISSION

Questions on Lighting Alterations?





What does a Field Inspector do?

- **Verify installed lighting power meets the Certificate of Compliance**
- **Verify mandatory lighting controls are installed**
- **Verify applicable Acceptance & Installation Forms are completed**





Simplify Inspections with Inspection Checklist

- **Inspection Checklist by EnergyCodeAce**
 - Used with the Plans Review checklist
 - Specifies which forms to verify
 - Electronic PDF to be completed in the field
 - <http://energycodeace.com/content/resources-checklists/>

Ace Resources 2013 Nonresidential - Title 24, Part 6 **Building Inspector** Permit Number: _____
Energy Inspection Checklist **EnergyCodeAce**
Helping you play your cards right

Project Address: _____

PROJECT CONTACTS				
Permit Applicant:		Phone:		
General Contractor:		Phone:		
Plans Examiner:		Phone:		
HERS Rater:		Phone:		
HERS Provider:		HERS Registration Number:		

OVERALL REQUIREMENTS					YES	NO	
Is Plan Examiner's checklist available?						<input type="checkbox"/>	<input type="checkbox"/>
All compliance documents completed, signed and registered with nonresidential registry (when required):							
NRCC (Certificate of Compliance — most current, if revised from plan review)						<input type="checkbox"/>	<input type="checkbox"/>
NRCI (Certificates of Installation)						<input type="checkbox"/>	<input type="checkbox"/>
NRCA (Certificates of Acceptance)						<input type="checkbox"/>	<input type="checkbox"/>
NRCV (Certificates of Verification — HERS) registered with a HERS provider						<input type="checkbox"/>	<input type="checkbox"/>
Building front orientation matches site plan						<input type="checkbox"/>	<input type="checkbox"/>
Floor area (ft²) of conditioned versus unconditioned spaces matches approved planset						<input type="checkbox"/>	<input type="checkbox"/>
Fuel type used for HVAC systems matches NRCC utility type						<input type="checkbox"/>	<input type="checkbox"/>

INSPECTIONS Do installed measures match NRCC and meet all mandatory requirements?							
Measure	Form Name	Required Forms			Notes	YES	NO
		NRCC	NRCA	NRCV			
SOLAR READY (NRCC-SRA)							
Confirm path taken (A, B, C, D or E)	SPV-01	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Minimum solar area provided		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
ENVELOPE (NRCC-ENV AND/OR NRCC-PRF)							
Exterior and demising wall construction details (i.e., cavity and continuous insulation)		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Roof construction details		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Cool roof: CRRC label verified		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Floor construction details		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Air barrier (per Table 3-18)		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Fenestration, by type:	ENV-01	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
Area at each orientation <NRCC		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
U-factor(NFRC,sitebuilt,default)		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
SHGC(NFRC,sitebuilt,default)		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
Visual transmittance (VT)		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
Exterior shading (i.e., overhangs, exterior shades)		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>

Continued on next page Page 1 of 4



§140.6 and the Field Inspector

- **At Rough Frame verify**
 - Installed watts/ft²
 - Shall not exceed values on NRCC-LTI-01 form
- **If PAF controls credits were used**
 - Verify controls are installed
 - Simplify with NRCI-LTI-05





§140.6 and the Field Inspector *cont.*

- **All req. NRCI-LTI forms must be verified**
 - Refer to [NRCC-LTI-01](#) (use as checklist)
 - Completed by installing contractor
- **All req. NRCA-LTI forms must be verified**
 - Refer to NRCC-LTI-01 (use as checklist)
 - Must be performed by Certified ATT

INDOOR LIGHTING

CEC-NRCC-LTI-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS**

NRCC-LTI-01-E

Indoor Lighting

(Page 2 of 5)

Project Name: **2013 CALBO Training Sample**

Date Prepared:

01/01/14

5.	Complies ONLY if Installed ≤ Allowed		Complies ONLY if Installed ≤ Allowed	
6.	Allowed Lighting Power Conditioned NRCC-LTI-03-E, page 1		Allowed Lighting Power Unconditioned NRCC-LTI-03-E, page 1	

Declaration of Required Installation Certificates – Declare by selecting yes for all Installation Certificates that will be submitted. (Retain copies and verify forms are completed and signed.)			
YES	NO	Form/Title	
<input checked="" type="checkbox"/>		NRCI-LTI-01-E - Must be submitted for all buildings	<input type="checkbox"/> Field Inspector
	<input checked="" type="checkbox"/>	NRCI-LTI-02-E - Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.	<input type="checkbox"/> Field Inspector
<input checked="" type="checkbox"/>		NRCI-LTI-03-E - Must be submitted for a line-voltage track lighting integral current limiter, or for a supplementary overcurrent protection panel used to energize only line-voltage track lighting, to be recognized for compliance.	<input type="checkbox"/> Field Inspector
	<input checked="" type="checkbox"/>	NRCI-LTI-04-E - Must be submitted for two interlocked systems serving an auditorium, a convention center, a conference room, a multipurpose room, or a theater to be recognized for compliance.	<input type="checkbox"/> Field Inspector
<input checked="" type="checkbox"/>		NRCI-LTI-05-E - Must be submitted for a Power Adjustment Factor (PAF) to be recognized for compliance.	<input type="checkbox"/> Field Inspector
	<input checked="" type="checkbox"/>	NRCI-LTI-06-E - Must be submitted for additional wattage installed in a video conferencing studio to be recognized for compliance.	<input type="checkbox"/> Field Inspector

Declaration of Required Certificates of Acceptance – Declare by checking all of the Certificates of Acceptance that will be submitted. (Retain copies and verify forms are completed and signed.)			
YES	NO	Form/Title	
<input checked="" type="checkbox"/>		NRCA-LTI-02-E - Must be submitted for occupancy sensors and automatic time switch controls.	<input type="checkbox"/> Field Inspector
<input checked="" type="checkbox"/>		NRCA-LTI-03-E - Must be submitted for automatic daylight controls.	<input type="checkbox"/> Field Inspector
	<input checked="" type="checkbox"/>	NRCA-LTI-04-E - Must be submitted for demand responsive lighting controls.	<input type="checkbox"/> Field Inspector



Certificate of Installation

- **Completed by the installing contractor for:**
 - EMCS or lighting control system (NRCI-LTI-02)
 - Track lighting current limiter or supplementary overcurrent protection panel (NRCI-LTI-03)
 - Two interlocked lighting systems (NRCI-LTI-04)
 - Power Adjustment Factors (NRCI-LTI-05)
 - Videoconference studio lighting (NRCI-LTI-06)



Final - Indoor Lighting

- **Controls**

Verify (each enclosed area):

Area controls

- ON/OFF controls

Shut-off controls

- Occupancy sensor, automatic time switch

Multi-level controls

- Dimming, Dimming Uniformity

NRCA-LTI-02 form

- *Acceptance test to verify lighting controls (simplify with this form)*





Final - Indoor Lighting *cont.*



- **Daylighting controls**
 - Dimming, photo sensor, etc.
(*separate from general lighting*)
 - **Demand Response Controls**
 - Reduction of lighting power by 15%
 - Req. when greater than 10,000 ft²
- NRCA-LTI-03 & 04***
- *Acceptance test to verify daylighting & DR controls (simplify with these forms)*



§10-103 and the Field Inspector

- At Final, verify signature on Certificate of:

- Installation (NRCI)
- Acceptance (NRCA)

- Verify NRCA-LTI forms are signed by Certified Acceptance Test Technician

STATE OF CALIFORNIA
ENERGY MANAGEMENT CONTROL SYSTEM OR LIGHTING CONTROL SYSTEM
CERT-NRCA-LTI-02-E (Revised 06/13)

CERTIFICATE OF INSTALLATION
Energy Management Control System or Lighting Control System
NRCA-LTI-02-E
(Page 5 of 5)

Project Name: 2013 CALBO Training Sample
Enforcement Agency: L0088 Jurisdiction
City: Sacramento
Permit Number: 010114
Job Order: 06814

If installed to qualify for a Power Adjustment Factor, submit this Installation Certificate in addition to the PAF Installation Certificate.

☐ G. To qualify for the PAF for a Partial-ON Occupant Sensing Control in TABLE 140.6-A
☐ H. To qualify for the PAF for an occupant sensing control controlling the general lighting in large open plan office areas above workstations, in accordance with TABLE 140.6-A
☐ I. To qualify for the PAF for a Manual Dimming System PAF or a Multiscene Programmable Dimming System PAF in TABLE 140.6-A
☐ J. To qualify for the PAF for a Demand Responsive Control in TABLE 140.6-A
☐ K. To qualify for the PAF for Combined Manual Dimming plus Partial-ON Occupant Sensing Control in TABLE 140.6-A

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name: Best Doc. Author
Documentation Author Company Name: Energy Savers Inc.
Address: 1516 9th Street
City/State/Zip: Sacramento, CA 95814
Documentation Author Signature: Best Doc. Author
Date Signed: 1/1/2014
CA LTRC Certification Identification (if applicable): N/A
Phone: (916) 362-4719

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Installation is true and correct.

2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.

3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.

4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.

5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name: Mr. Lighting Contractor
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner) Best Lighting Comp.
Address: 123 Edison Street
City/State/Zip: Sacramento, CA 95814
Responsible Builder/Installer Signature: Mr. Lighting Contractor
Position With Company (Title): Owner
CSB License: 910113
Phone: (916) 411-4528
Date Signed: 1/1/2014

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2013



CALIFORNIA ENERGY COMMISSION

QUESTIONS...





Resources - Blueprint

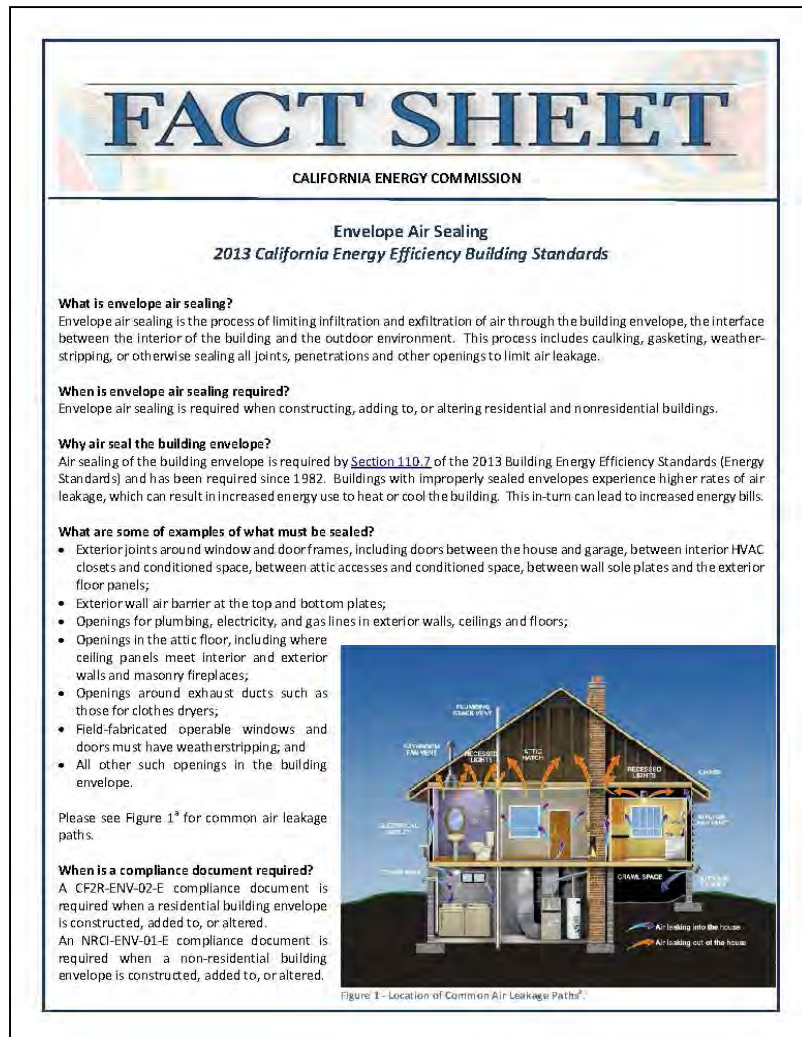
- Published every other month
- Clarifications on frequently asked questions
- Receive by e-mail
- <http://www.energy.ca.gov/efficiency/blueprint/>





Resources - Fact Sheets

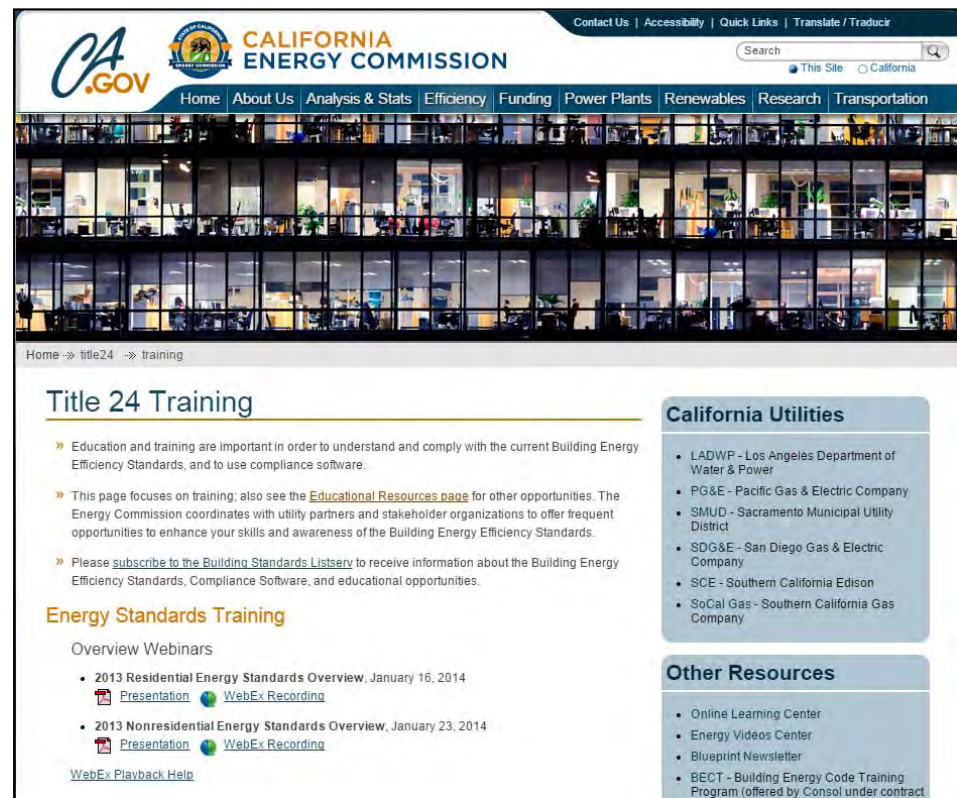
- 5 published to date
- Detailed clarifications on specific topic/requirements
- Receive by e-mail (listserver)
- <http://www.energy.ca.gov/efficiency/factsheets/>





Resources - Training

- Provided by Utilities
- Free of charge
- Can request for training in your region/area
- CEC training
- <http://www.energy.ca.gov/title24/training/>





- Forms tools
- Free training (in person and online)
- Checklists, Trigger Sheets for building dept.
- <http://www.energycodeace.com/content/home/>

Did you Know?

Permits Can Save Energy
Statewide gross savings from Codes & Standards realized between now and 2020 is approximately equivalent to:

- Deferring the need to run a 500 MW power plant for 16 years
- Removing 2.6 million cars from the road


Permits Can Save Money
and Protect the Value of Your Home Investment.

- Non-permitted home improvements may not retain their value when you sell

Permits Make a Difference in Reputations
Clients value quality and integrity.


Getting a permit means you are doing it right and can be trusted as a quality contractor who doesn't take shortcuts.

Not pulling a permit is breaking the law – and can cost you your contractor's license.




Comply With Me
 Performed by the Irvington High School Viking Marching Band
 Watch the full video [here](#).


We offer FREE:



A variety of tools to help you identify the forms, installation techniques, and standards relevant to building projects in California.



Classroom and online trainings on Title 24, Part 6. Additional 2013 classes coming soon!



Fact Sheets, Trigger Sheets and Checklists to help you understand when Title 24, Part 6 is "triggered" and how to correctly comply

Log In or Register

Enter your e-mail address below to log in or to register a new account.

ENTER YOUR EMAIL BELOW

Go

It's time to comply - the 2013 Building Energy Code is now in effect!

Energy Code Ace FREE Tools, Training and Resources can help you be prepared to comply, and our rendition of "Comply With Me" will help you do it with a bounce in your step and smile on your face (ok, ok – but at least it's fun to watch!) See the "teaser" on our Home page and the full version on the [EnergyCodeAce YouTube channel](#). Special thanks to the amazing Irvington High School Viking Marching Band!

Countdown to July 1:

0	0	0
Months	Days	Hours

Calendar

Click on the blue dates to view event details

March 2015						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
2	3	4	5	6	7	8



Resources - Hotline

- Toll-free in California
- Open Monday through Friday
 - 8:00 am to noon, and
1:00 pm to 4:30 pm
- Call at:
 - 1-800-772-3300 (In CA)
 - (916) 654-5106 (Outside CA)
- OR, e-mail at: Title24@energy.ca.gov



Resources - Listservers

- Main conduit for communicating with stakeholders
- Sign up at:
 - <http://www.energy.ca.gov/listservers/>
- Subscribe to the following Efficiency Lists:
 - Building Standards
 - Blueprint
 - Efficiency
- Respond to confirmation e-mail within 48 hours